

# PATENT SPECIFICATION

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NO DRAWINGS.

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## COMPLETE SPECIFICATION.

### Hair Bleaching Composition.

We, RAYETTE-FABERGE INCORPORATED formerly Rayette Incorporated, a corporation organized and existing under the laws of the State of Minnesota, United States of America, located at 261 East 5th Street, St Paul 1, State of Minnesota, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the bleaching of human hair and particularly to a bleaching composition especially adapted for "touch up" purposes in bleaching new hair growth of a fraction of an inch close to the scalp. To be successful, such localized bleaching must involve a minimum of overlapping of previously bleached hair, which would over-bleach and cause hair damage, and it should minimize scalp irritation from ammonia conventionally used with peroxide to effect the bleach. To be effective, the composition must remain in place at the base of the hair for the time needed for the bleach, retaining, while in place, the optimum alkalinity and moisture content needed to continue the bleaching action. To give such compositions the thickness or body needed for immobility in localized application, it has been common to add adsorbent "white henna" materials such as mixtures of magnesium carbonate and magnesium oxide or magnesium trisilicate. Such adsorbents and bleach compositions using them have a number of limitations which the present invention seeks to obviate.

The invention consists in a dry powder for admixture with hydrogen peroxide and a liquid ammonium soap to form a hair bleach of gelatinous consistency comprising a persulfate salt of a cation selected from alkali metals and ammonium, and an anhydrous alkali metal silicate, the silicate and persulfate salts being present in a weight ratio range of 1:4 to 1:7 and forming, upon wetting with both of said liquids, a gel in the pH range of from 9.3 to not more than 10.

When the dry powder of the invention is mixed with hydrogen peroxide and a liquid ammonium soap and the mixture gelled to form a bleaching composition we have found that it possesses unexpected properties far superior to other compositions for the purpose, including those employing adsorbents and the same per-acid salts. The composition maintains a stable alkalinity at the optimum pH value; it retains its moisture content over long bleach processing times and it can readily be shampooed out of the hair with no dry powdery residue. The composition affords a wide range of selectivity of bleaching strengths by enabling the operator to mix the hydrogen peroxide with a unit quantity of liquid ammonium soap and selected different quantities of dry powder mix comprising the silicate and the per-acid salt, to form a range of bleaching compositions of different graded strengths but in which the pH value remains within a desired narrow range.

A hair bleach produced from the dry powder of the invention preferably comprises:

hydrogen peroxide  
aqueous ammonium hydroxide  
fatty acid

solvents (water which may contain alcohol)  
alkali metal or ammonium persulphate  
anhydrous water-dispersible alkali metal  
silicate

- 5 The composition may also contain wetting  
agents, dyes and perfumes, usually employed  
in hair treating compositions.

The fatty acid and ammonium hydroxide  
form an ammonium soap which is liquid  
at room temperature with an alkaline pH.  
10 Oleic acid is preferred, but others, includ-  
ing myristic, palmitic, and lauric, may also  
be used, as may stearic acid, although a  
stearic soap generally requires additional  
15 solvent to lower the viscosity. The soap  
contributes alkalinity, aids in achieving the  
desired consistency of the gel, and functions  
as a shampoo in the removal of the bleach.  
We have found an alkaline soap liquid hav-  
20 ing a pH of 9.3—9.6 to be satisfactory for  
admixture with the solids mixture. Further,  
a stoichiometric excess of ammonium  
hydroxide to fatty acid is used. A mole  
ratio of 1.25—1.6 moles of hydroxide per  
25 mole of fatty acid is the preferred range.

Ammonium or potassium persulphate is  
preferably used, and superior results are  
achieved by a mixture of both. The com-  
position should provide persulfate, am-  
monium and potassium ions in solution, for  
30 which purpose, of course, one salt need not  
be a persulfate but can be a water-soluble  
sulfate or a salt of another acid. We have  
obtained good results with a mixture of  
35 potassium persulfate and diammonium phos-  
phate. In our preferred composition, we  
use approximately three parts by weight of  
potassium persulfate to one of ammonium  
persulfate. The salts aid in the bleaching  
40 by their oxidizing action, thus reducing the  
quantity of hydrogen peroxide required; they  
act with the silicate and the soap not only  
to buffer the bleach to an alkalinity within  
the desired pH range (which persists while  
45 the bleach acts on the hair despite volatility  
of other alkaline components) but also to  
achieve a gel of desired consistency which  
lasts throughout the bleaching operation.  
The gel may have a broad range of viscosity.  
50 However, it must not be too low, otherwise  
it will flow throughout the hair. Neither  
must it be so thick as to interfere with its  
uniform distribution on the hair contiguous  
to the scalp. Desirably, the composition  
55 possesses the property of reduced viscosity  
when subjected to stress and a firming when  
the stress is removed. In this way the  
bleaching composition flows onto the hair  
during application and then sets to a more  
60 rigid form so as to prevent flow to other  
areas of the hair.

The anhydrous water-dispersible, alkali  
metal silicate forms, with the other com-  
ponents, a gel of desired consistency and

acts with the per-salts and soaps to buffer 65  
the bleach to the desired range of alkalinity,  
despite varying proportions of solids to  
liquids, as we shall refer to, and which  
alkalinity persists stably during the bleach.  
70 We prefer sodium metasilicate as it is readily  
dispersible as a finely-divided powder, and  
is highly alkaline. The sodium metasilicate  
aids in imparting the required alkalinity with  
a lower pH value than if ammonium  
hydroxide alone were used. 75

The liquid and dry wetting agents which  
may be employed aid in the formation of  
a smooth gel quickly and for this use must  
be stable and compatible to alkalinity and  
oxidizing agents. Dry wetting agents may  
80 be for example Aerosol OS (isopropyl  
naphthalene sodium sulfonate), Aerosol OTB  
(dioctyl ester of sodium sulfosuccinic acid),  
Alfracal (alkyl aryl sodium sulfonate) and  
Dupanol ME dry (sodium lauryl sulfate). 85  
The liquid wetting agents, also stable in the  
presence of alkaline and oxidizing agents,  
may be for example Igepal CO-430 (nonyl-  
phenoxy poly-ethyleneoxy-ethanol) and Brij  
30 (a polyoxyethylene lauryl ether). 90

Our composition preferably has a pH  
within the range of 9.3 to 9.7, and may be  
up to 9.8, but not more than 10.

Although there are specific relative  
amounts in which these components are pre- 95  
ferably employed for best results, a feature  
of the invention is that the liquid com-  
ponents, in certain proportions, separately  
packaged, may be admixed for use in a  
wide range of ratios of total packaged liquids 100  
to total packaged solids to afford a range  
of bleaching actions while providing the  
desired gel consistency and the desired pH  
within a limited range. The selectability is  
105 illustrated by the following examples:

#### Example 1

The following liquids and the following  
solids were separately mixed and separately  
packaged:

Liquids		By Weight	
Oleic acid	... ..	22%	110
Ammonium hydroxide (29% aq. solution)	... ..	7%	
*Wetting agent	... ..	40%	115
Alcohol	... ..	13%	
Dyes and chelating agents	... ..	1%	
Water	... ..	17%	
		100%	

\*The wetting agents used in this composi-  
tion are nonylphenoxy poly (ethyleneoxy) 120  
ethanol, ammonium oleate or polyoxy-  
ethylene-4-lauryl ether or a combination of  
these.

The chelating agent used was N, N-di (2-  
hydroxyethyl) glycine mono-sodium salt. 125

<i>Solids</i>	<i>By Weight</i>
Ammonium persulphate ... ..	21%
Potassium persulphate ... ..	63%
Sodium metasilicate ... ..	15%
5 Dry wetting agent (sodium lauryl-sulphate) ... ..	1%
	100%

10 For a single application, 4 ounces of 20-volume hydrogen peroxide were mixed with 12 grams of solids and the mixture shaken. Two ounces of the liquids were then added to form a creamy paste ready for application to the hair. The composition had a pH of 9.3.

#### 15 *Example 2*

The same mixture was used as in Example 1 except that twice as much of the dry solids, 24 grams, were added to the same quantity, 4 ounces, of hydrogen peroxide and the same quantity, 2 ounces, of liquids. A creamy gel of substantially the same physical characteristics as in Example 1 was obtained and with a pH of 9.5, which produced a lighter and somewhat faster 25 bleach than the composition of Example 1.

#### *Example 3*

30 The same mixtures as in Example 1 again were employed except for the use of 3 times the solids, or 36 grams. Again, the consistency of the gel was about the same, the pH had not risen significantly, being 9.6, still within the range, but now the mixture bleached substantially lighter and faster.

35 In these examples the sodium metasilicate is present as 15% by weight of the dry solids and the per-salts total 84% so that the ratio of the gel forming silicate to the per-salts is approximately 1 to 6. We have found that this ratio should be kept within 40 the range from 1 to 4 to 1 to 7.

In use, we have found that the composition has a creamy gel consistency which is very well adapted for localized application to the scalp portions of the hair strands in

45 retouching, although, of course, the composition may be used for a total bleach. It affords a fast bleaching action with the paste retaining its moisture consistency and alkalinity until the bleach is finished, when it may readily be shampooed away by working up suds simply by the addition of water. 50 When used locally at the scalp or root portion of the hair, it is of a consistency to facilitate application only to the new hair growth without overlapping previously 55 bleached hair; and the peroxide is held well in the mix without running on the scalp as with prior similar compositions.

#### WHAT WE CLAIM IS:—

1. A dry powder for admixture with 60 hydrogen peroxide and a liquid ammonium soap to form a hair bleach of gelatinous consistency comprising a persulfate salt of a cation selected from alkali metals and ammonium, and or anhydrous alkali metal 65 silicate, the silicate and persulfate salts being present in a weight ratio range of 1:4 to 1:7 and forming, upon wetting with both of said liquids, a gel in the pH range of from 9.3 to not more than 10. 70

2. A dry powder as claimed in claim 1 comprising approximately three parts by weight of potassium persulfate to one part of ammonium persulfate and an anhydrous 75 alkali metal silicate, the silicate and persulfate salt mixture being present in a weight ratio range of from 1:4 to 1:7 and forming, upon wetting with both of said liquids, a gel in the pH range of from 9.3 to not 80 more than 10.

3. A dry powder according to claim 1 for admixture with hydrogen peroxide and a liquid ammonium soap to form a hair 85 bleach of gelatinous consistency substantially as hereinbefore described with reference to the Examples.

MARKS & CLERK,  
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Agents for the Applicants.



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RAPPORT DE RECHERCHE  
PRÉLIMINAIRE

établi sur la base des dernières revendications  
déposées avant le commencement de la recherche

N° d'enregistrement  
national

FA 623613  
FR 0208855

DOCUMENTS CONSIDÉRÉS COMME PERTINENTS		Revendication(s) concernée(s)	Classement attribué à l'invention par l'INPI
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			DOMAINES TECHNIQUES RECHERCHÉS (Int.Cl.7)
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Date d'achèvement de la recherche		Examineur	
25 mars 2003		Stienon, P	
<b>CATÉGORIE DES DOCUMENTS CITÉS</b>			
X : particulièrement pertinent à lui seul Y : particulièrement pertinent en combinaison avec un autre document de la même catégorie A : arrière-plan technologique O : divulgation non-écrite P : document Intercajalre			
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**ANNEXE AU RAPPORT DE RECHERCHE PRÉLIMINAIRE  
RELATIF A LA DEMANDE DE BREVET FRANÇAIS NO. FR 0208855 FA 623613**

La présente annexe indique les membres de la famille de brevets relatifs aux documents brevets cités dans le rapport de recherche préliminaire visé ci-dessus.  
Les dits membres sont contenus au fichier informatique de l'Office européen des brevets à la date du 25-03-2003  
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Pour tout renseignement concernant cette annexe : voir Journal Officiel de l'Office européen des brevets, No.12/82